Economics 101
Fall 2016
Homework #2
Due Thursday, October 13, 2016

Directions:

- The homework will be collected in a box **before** the lecture.
- Please place **your name**, **TA name** and **section number** on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade.
- Late homework will not be accepted so make plans ahead of time.
- **Show your work**. Good luck!

Please realize that you are essentially creating "your brand" when you submit this homework. Do you want your homework to convey that you are competent, careful and professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!

1. Demand Shifts

Consider the following scenarios and indicate the effects on demand. For each scenario, draw a graph, show if there is a movement along the curve or a shift, and show the effect on the equilibrium price and quantity.

a. Suppose the government announces in November that a tax increase of 3% on snow blowers will occur during the month of December. What will happen to the demand for snow blowers during the month of November?

b. Assume that Top Ramen noodles are an inferior good. Consumer income rises in 2016. What are the effects of an increase in consumer income on the demand for Top Ramen noodles in 2016?

c. A recent study claims that carrageenan, a key ingredient found in frozen yogurt, is linked to an increased risk for cancer. How will this study impact the demand for frozen yogurt?

d. You believe that ice cream is a tasty substitute for frozen yogurt. Given the information in part (c), how will the demand for ice cream change?

e. After the launch of driver-less taxis in Pittsburgh, a glitch in the technology caused several road accidents. How will this impact the demand for driverless taxis? How will this impact the demand for traditional taxis?

f. Consider the market for college education. Suppose an influential economist announces that the value of college education is now lower than a salaried position requiring only a high-school degree. How will this new information affect the demand of college education?

2. Market Demand, Consumer Surplus, Producer Surplus

Consider the demand for widgets. The population of City A collectively has demand for widgets expressed by the equation Q = 200 - 10P where Q is the quantity of widgets and P is the price. The population of City B has a demand for widgets expressed by the equation Q = 200 - 40P.

a. Draw the demand curves of City A and City B on separate graphs. Label your intercepts, where the y-intercept represents the price at which zero quantity is demanded.

b. Draw the market demand curve of widgets for both City A and City B. Clearly label the kink point. Give the equation of the market demand curve for each linear segment. In your equation, express quantity as the dependent variable (that is, write your equation in x-intercept form).

c. Suppose the supply curve for widgets is Q = 40P - 240. What is the equilibrium price and quantity of widgets? Make sure you are using the market demand curve from part (b).

d. Calculate the value of producer and consumer surplus when this market is at its equilibrium. Show your work.

e. How much of the consumer surplus goes to the City B population when the widget market is in equilibrium?

3. Price Ceilings and Price Floors

The supply and demand functions for apples is as follows:

Market Demand: $Q_D = 10 - 2P$

Market Supply: $Q_S = 3P - 9$

a. Suppose the United States government imposes a price ceiling at $6. Is there a shortage or a surplus in this market?

b. Now suppose the government lowers the price ceiling to $3.50 per apple. Describe the change in the shortage or surplus.

c. Now suppose the government imposes a price ceiling or price floor that leaves a surplus of 4 units. Given this information is this a price floor or a price ceiling? What government implemented price would create this surplus?

4. Joint PPF and trading range of prices

Pentos and Volantis are two cities that produce both swords (S) and daggers (D). The workers in Pentos need 4 hours to make one sword and 2 hours to make one dagger. The workers in Volantis need 3 hours to make either one sword or one dagger. Workers in both cities work 12 hours a day.

a. Which city has a comparative advantage in producing swords? Which city has a comparative advantage in producing daggers?

b. The two cities now engage in bilateral trade (that is, they trade with one another). Draw the joint PPF graph. Put swords on the horizontal axis and daggers on the vertical axis. Label the coordinates of any "kink points".

c. Find the slope-intercept form of each line segment that makes up the joint PPF curve.

d. What is the trading range of prices for one sword? What is the trading range of prices for one dagger? In your answer be careful to include the units of measurement.

e. The consumers in the two cities demand a total production of 3 swords and 7 daggers. Under this scenario, which city is producing swords, and which city is producing daggers?

f. A third city, Braavos, now enters the market. The workers of Braavos could at most produce either 6 swords or 6 daggers in a day. Draw a new joint PPF curve for all three cities. How many kink points are there?

g. What is the trading range of prices for one sword between all three cities?

5. International trade

The supply and demand curves for sushi rolls in Japan are:

Supply: $P = 2Q + 100$

Demand: $P = 1000 - 4Q$

The price is measured in Japanese Yens (￥), while the quantity is measure in the millions.

a. Under autarky (this term means that the market is closed to trade and that there is no international trade), how many sushi rolls are produced in Japan? What is the price for one sushi roll?

b. Suppose that Japan enters the international market for sushi, where one sushi roll costs ￥100. Given this information, how many sushi rolls does Japan import? Find the consumer surplus (CS) and the producer surplus (PS).

c. To protect its sushi industry, the Japanese government decides to impose a quota on imported sushi rolls. Now Japanese consumers can at most buy 75 million foreign sushi rolls, and only through a certified importer, Cheap Sushi Inc. Given this information, find the consumer surplus (CS) and producer surplus (PS) again. What is the deadweight loss (DWL) resulting from the imposition of this quota?

d. As the CEO of Cheap Sushi Inc., what is the maximum amount you are willing to pay for the legal right to sell imported sushi rolls?

e. Due to complaints from the World Trade Organization (WTO), the Japanese government decides to drop the import quota, but subsequently imposes a tariff that leads to the same amount of imports as under the previous quota. What is the amount of the tariff? What is the resulting deadweight loss?

f. The world price for sushi rolls rises to ¥200, but the Japanese government still wants to keep the amount of its imports at 75 million. What is the quota level that could accomplish this goal? If instead of using a quota the government decided to implement a tariff, what would the tariff price need to be to accomplish this goal? Calculate the deadweight loss that results from implementing these two alternative policies.

g. Now, return to the scenario where world price equals ¥100. Find all the possible tariff levels that maximize dead weight loss, then find all the possible tariff levels that minimize it.

h. Now, return to the scenario where world price equals ¥100. Find all the possible quota levels that maximize the consumer surplus, then find all the possible quota levels that maximize the producer surplus.

i. (Challenging!) Find the tariff level that maximizes government revenue. What is the maximum revenue the government can get from imposing a tariff in this market?

6. Price support and price guarantee

During the Great Depression, cow farms in the U.S. were often forced to dump fresh milk into the rivers, because the price for milk was too low for the farms to stay profitable. Theoretically, multiple government policies could help dairy farmers in this situation by keeping milk prices high.

a. Suppose that the supply and demand for milk are given by the following equations where Q is the quantity in units of milk and P is the price per unit of milk:

Supply of Milk: $Q = (1/2)P - 3$

Demand for Milk: $Q = 27 - (1/3)P$

What are the equilibrium price and quantity in the milk market without government intervention? Illustrate your answer with a well labeled graph.

b. The government tries to raise milk prices using a price support program. It sets the price at $54 per unit of milk, and commits to buy any leftover milk. Given this program, how much milk do consumers buy? How much milk does the government buy? What is the cost of the program to the government?

c. Now, suppose the government still wants to keep the price of milk at $54 per unit of milk, but instead of implementing a price support program the government decides to enact a price guarantee program that will subsidize the milk producers. Under this scenario, how much milk will consumers buy? What is the cost of the program to the government? Illustrate your answer with a well labeled graph.

d. Given the market and the programs described in this problem answer the following questions and provide a rationale for your answer to each question. Which program will the consumers prefer? Which program will the producers prefer? Which program will the government prefer?

e. Could you think of any reason for the government to prefer the price guarantee program?